

REMARKS

Claims 58-61 and 63-73 remain in the application.

35 USC 103 rejections

The Examiner has rejected claims 58-59 and claims 63, 65, 66, 67, 68, 70, and 73 under 35 USC 103(a) as being unpatentable over Uzoh in view of Murphy. Applicant respectfully traverses these rejections and requests reconsideration.

The Examiner has failed to properly consider the inventive steps cited in claims 58 and 59, which recite the use of a two-step polishing process where the organic additive is included in the CMP slurry only at the very end of the polishing sequence. Specifically, claim 58 states “incorporating into said polishing slurry for a final portion of said total polishing period of time less than or equal to 10% of said total polishing period of time, an organic additive... said organic additive not being included in said polishing slurry prior to said final portion of said total polishing period of time”. Similarly, claim 63 recites a two-step process where the slurry flow is decreased after a first polishing period, and the polishing additive is flowed during a second polishing period. This two-step polishing sequence has been developed as a method to minimize clogging of filters in the polisher (as stated in the specification, page 31, line 25), and to prevent copper staining and precipitates onto the wafer. There is no recognition by the Uzoh reference of any staining, precipitation, or clogging problems associated with the use of an organic additive during the entire polishing process, and Uzoh’s process includes the Alkanol surfactant during the entire polishing period. Thus not only doesn’t Uzoh recognize the problem and hence the source

of the problem, but Uzoh expressly teaches away from the two-step polishing process claimed in the present invention by using an organic additive throughout the process.

The Examiner asserts that Murphy's teaching of column 6, lines 12-16, that "Time at temperature and mixing of the liquids can be delayed until the liquid is within centimeters of actual dispense onto the polishing pad" reads on the Applicant's claim of "additive not being included in said polishing slurry prior to said final portion of said total polishing period of time". Applicant strongly traverses this assertion. Murphy's invention is purely directed at the mixing of the slurry ingredients as soon as possible before the dispensing of the slurry onto the wafer. In the citation by the Examiner, Applicant notes that Murphy specifies the time delay of mixing the liquids in terms of the time before the slurry is dispensed onto the polishing pad, not in terms of the polishing period of the wafer. Murphy in fact never mentions the polishing period on the wafer. Murphy's statement about cost and time reduction (column 6, lines 24-26, refers to a cost savings from lessening the amount of chemicals wasted due to "the short shelf life of the chemicals after they are heated and mixed, or changes in concentration due to evaporation in a mixture" (column 6, lines 17-19). There is no teaching, implication, or suggestion in Murphy of including an organic additive in the polishing slurry as claimed in the present invention, only during the final portion of the total polishing period of time.

In view of Uzoh's teaching away from the two-step polishing process claimed in the present invention, and of the total absence of any teaching or implication in Murphy regarding a two step process wherein the organic additive is included in the slurry only during a final portion of the polishing period of the wafer, Applicant strongly asserts that the Examiner has failed to make a prima

facie case that the present invention is taught or implied by Uzoh, Murphy, or a combination of the two. Applicant further asserts that, since the two step process as broadly claimed in claims 58, 59, and 63 is neither taught nor implied by Uzoh and Murphy, the more narrowly defined process as claimed in claims 65, 66, 67, 68, 70, and 73 is also neither taught nor implied by Uzoh and Murphy.

Applicant therefore respectfully requests that the 35 USC 103 rejections of claims 58, 59, 63, 65, 66, 67, 68, 70, and 73 be withdrawn.

The Examiner has rejected claims 60-61, 64, 69, 71, and 73 under 35 USC 103 as being unpatentable over Uzoh in view of Murphy et al and further in view of Yu et al. Applicant respectfully traverses these rejections.

As described above, there is no recognition in the Uzoh reference of any staining, precipitation, or clogging problems associated with the use of an organic additive during the entire polishing process or of the cause of the problem, and Uzoh's process expressly requires the Alkanol surfactant during the entire polishing period. Thus Uzoh teaches away from the two-step polishing process claimed in the present invention. Further, there is no teaching, implication, or suggestion in Murphy of including an organic additive in the polishing slurry, as claimed in the present invention, only during the final portion of the total polishing period of time. Accordingly, Applicant asserts that the present invention is neither taught nor implied by Uzoh, Murphy, or a combination of the two.

Applicant further asserts that the inclusion of Yu in no way provides any implication or teaching of the present invention, or in specific of the process details, including concentrations, as claimed in claims 60-61, 64, 69, 71, and 73 of the present invention. Yu does not describe, disclose, teach, or imply a two step polishing process as in the present invention, wherein an organic additive is

included for a final portion only of the total wafer polishing time. Yu discusses adjustability of process parameters, but adding this reference does not assist in making a *prima facie* case. The claimed elements of this process are not disclosed in any of the references, and even if it were suggested to combine these references, since the claimed elements are not disclosed, the Examiner has not presented a *prima facie* case.

Applicant therefore respectfully requests that the 35 USC 103 rejections of claims 60, 61, 64, 69, 71, and 73 be withdrawn.

Applicant has made a diligent attempt to address all of the Examiner's points. It is believed that the application is now in condition for allowance. An early Notice is requested.

Respectfully submitted,



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